

REMARKS

Claims 1-20 are pending in the Application.

Claims 1-20 stand rejected.

Claims 1, 4, 5, 7, 11, 13, 19, and 20 have been amended.

I. CLAIM AMENDMENTS

Independent claim 1 has been amended to recite “alignment marks embedded in an embedding material included in bulk material of the imprint template, wherein the embedding material surrounds the alignment marks.” This amendment is supported by the specification at paragraph 29, 3rd sentence (emphasis added):

Still further, in accordance with one or more embodiments of the present invention that are useful for optical alignment techniques, the alignment marks are fabricated from a material whose index of refraction is different from that of at least *the bulk material of the imprint template surrounding the alignment marks* and that of the material into which an imprint is made in carrying out an imprint lithography process.

In particular, the term “embedding material” is equivalent to the phrase “the bulk material of the imprint template surrounding the alignment marks.” Thus, Applicants respectfully assert that the use of the term “embedding material” is inherently supported by Applicants’ specification and presents no new matter.

Claims 4 and 5 have each been amended to replace “the bulk material of the imprint template surrounding the alignment marks” with “the embedding material.” These amendments have been made for consistency with claim 1.

Claim 7 has been amended to recite, in part, “a material disposed between the alignments marks and a surface of the imprint template is the same material as the

embedding material.” This amendment is supported by Applicants’ specification at paragraph 29, 6th sentence (emphasis added):

Still further, in accordance with one or more further embodiments of the present invention, *the alignments marks may be embedded into the imprint template by covering them with the same material used to fabricate the imprint template itself*, thereby assuring compatibility with a surface modifying release layer applied to the imprint template.

This amendment has been made to clarify the relationship between the “a material” of claim 7 and the antecedent “embedding material” of claim 1.

Independent claim 11 has been amended to recite “alignment marks embedded in an embedding material included in bulk material of the imprint template, wherein said embedding material surrounds said alignment marks.” This amendment is support by Applicants’ specification for the same reason as given above for the amendment to Claim 1.

Claim 13 has been amended to replace “the bulk material of the imprint template surrounding the alignment marks” with “the embedding material.” This amendment has been made for consistency with claim 11.

Independent claim 19 has been amended to replace “depositing a material over the alignment marks” with “covering the alignment marks with the same material used to fabricate the imprint template itself.” This amendment is supported by Applicants’ specification at paragraph 29, 6th sentence, which section is quoted above with respect to claim 7. The same emphasized text in the above quote pertains to amended Claim 19.

Claim 20 has been amended to depend from claim 19.

II. REJECTIONS UNDER 35 U.S.C. § 102

A. *Gimkiewicz*

Claims 1-8 and 11-16 stand rejected under 35 U.S.C. 102(b) as being anticipated by *Gimkiewicz* (EP1460738A2). Applicants respectfully traverse.

If *Gimkiewicz* were available as a reference (see below, 5th paragraph of this section), Applicants note that at col. 7, lines 25-31, *Gimkiewicz* discloses:

Fig. 1 schematically shows a cross-sectional view of a mask substrate 100 comprising a UV transparent body 101, for example form of glass or any appropriate material, having formed *thereon* a UV absorbing or blocking pattern 102, which may, for example, be formed of chromium or other appropriate material.

Further, at col. 58, lines 55-56, *Gimkiewicz* discloses:

Thus the mask substrate may comprise a UV transparent body 101 and a UV blocking pattern 102.

Still further, at col. 7, lines 38-44 (still referring to Fig. 1), *Gimkiewicz* discloses:

A layer 103 of transparent replica material is formed *on* the mask substrate 100 and may comprise, in one preferred embodiment, an organically modified ceramic material as is known as ORMACER®. In a further preferred embodiment, the layer 103 may comprise silicone.

Therefore, as shown in Fig. 1 of *Gimkiewicz*, *Gimkiewicz* discloses a structure in which UV blocking pattern 102 is on UV transparent body 101 and under layer 103. Thus, *Gimkiewicz* does not disclose a UV blocking pattern 102 embedded in bulk material of UV transparent body 101. Rather, *Gimkiewicz* discloses a UV blocking pattern 102 on UV transparent body 101, and thus on the surface of UV transparent body 101. It will be obvious to one of ordinary skill in the art that the surface is not part of the bulk, as surface and bulk are known in the art to be mutually exclusive.

Further, *Gimkiewicz* does not disclose a UV blocking pattern 102 surrounded by bulk material contained in UV transparent body 101. Rather, *Gimkiewicz* discloses layer 103 over UV blocking pattern 102, where layer 103 is materially distinct from UV transparent body 101. For example, *Gimkiewicz* discloses that UV transparent body 101 is formed for example of glass, whereas layer 103 is formed for example of silicone. Further, the term “embed,” as defined for example by the concise Oxford English Dictionary (1982), means “fix firmly in surrounding mass.”

Thus, Applicants respectfully asserts that originally filed claims 1 and 11 would be neither anticipated nor rendered obvious by *Gimkiewicz* if *Gimkiewicz* were available as a reference.

Further, Applicants respectfully assert that because *Gimkiewicz* is a *foreign* publication published after Applicants’ filing date, it is not available as a reference for rejections under either 35 U.S.C. 102(a), 102(b), or 102(e). In particular, *Gimkiewicz* was published September 22, 2004 on an EP application filed March 21, 2003. Applicants’ filing date is September 18, 2003, before the publication date of this foreign application.

However, in the interests of furthering prosecution and in conjunction with Applicants’ remarks below in the section with regard to Mancini, Applicants have amended independent claims 1 and 11 to recite “alignment marks embedded in an embedding material included in bulk material of the imprint template, wherein said embedding material surrounds said alignment marks.” These amendments clarify that the embedding material surrounds the alignment marks. The embedding material is described in Applicants’ specification at paragraph 29, 3rd sentence as “the bulk material of the imprint template surrounding the alignment marks.”

For the above-described reasons, *Gimkiewicz* neither discloses nor renders obvious “alignment marks embedded in an embedding material included in bulk material of the imprint template, wherein said embedding material surrounds said

alignment marks,” as recited in Applicants’ amended independent claims 1 and 11 and further is not available as a reference against Applicants’ claims. Thus, Applicants respectively assert that independent claims 1 and 11 are patentable over *Gimkiewicz*.

Further, Applicants respectfully assert that dependent claims 2-8 and 12-16, with their respective limitations, are likewise neither anticipated nor rendered obvious by *Gimkiewicz* and are thus patentable over *Gimkiewicz*.

B. *Mancini*

Claims 1-7 and 11-15 stand rejected under 35 U.S.C. 102(b) as being anticipated by *Mancini* (U.S. Patent 6,387,787). Applicants respectfully traverse.

The Examiner asserted that “*Mancini* teaches a lithographic template having a bulk material of the template (12), alignment marks (22) that are of another material having a different index of refraction including a metal (gold), space between the alignment marks (25) allowing for radiation to pass through, and the use of a mask in creating the template (Col. 5, line 45).”

Initially, in response, Applicants note that *Mancini* ascribes gold as a suitable material for patterning layer 20. In particular, at col. 5, lines 3 – 14, *Mancini* discloses:

Transparent materials that are disclosed as being suitable for the fabrication of patterning layer 20 are tungsten (W), ..., gold (Au), chrome (Cr), or the like.

Further, reference numeral 22 is used for the surface of patterning layer 20. For example, at col. 5, lines 33-35, *Mancini* discloses:

Formed thereon surface 22 of patterning layer 20 is a resist layer 24, ...

Applicants respectfully note that the Examiner may have intended “alignment marks (20)”, where “alignment marks (22)” is printed in the Office Action.

Proceeding, in response, Applicants note that at col. 4, lines 56-59 *Mancini* discloses:

Referring now to Fig. 3, illustrated is substrate 12, having formed thereon etch stop layer 16. There is additionally formed on surface 18 of etch stop layer 16, a patterning layer 20.

Yet further, at col. 5, lines 50-59, *Mancini* discloses:

During fabrication, photoresist layer 24 serves as a mask for the etching therethrough of patterning layer 20. As illustrated in Fig. 6, patterning layer 20 is etched through to surface 18 of etch stop layer 16, thereby exposing portions 25 of etch stop layer 16.... Finally, to complete template 10 resist layer 24 is removed.

Even in the instance when a hard mask layer is sandwiched between patterning layer 20 and resist layer 24, because portions 25 are exposed, the sides of the features of patterning layer 20 shown in Figs. 5-7 of *Mancini*, are exposed by the process of etching.

Thus, patterning layer 20 is not surrounded by any material. In consequence, patterning layer 20 is not embedded in any material. In particular, as discussed above, the term “embed,” as defined for example by the concise Oxford English Dictionary (1982), means (emphasis added) “fix firmly in *surrounding* mass.” Thus, because *Mancini* discloses exposure of portions of patterning layer 20, *Mancini* discloses no embedding at all of patterning layer 20. Further, surface 22 by being one of a plurality of surfaces of patterning layer 22 cannot be surrounded by virtue of being a two dimensional surface. Still further, while it may contact a hard mask, it is not embedded in a hard mask. Thus, *Mancini* does not disclose embedding of surface 22.

Therefore, for the foregoing reasons, Applicants respectfully assert that originally filed independent claims 1 and 11 are neither anticipated nor rendered obvious by *Mancini*.

However, in the interests of furthering prosecution, Applicants have amended independent claims 1 and 11 to recite “alignment marks embedded in an embedding material included in bulk material of the imprint template, wherein said embedding material surrounds said alignment marks.” As stated above, these amendments clarify that the embedding material surrounds the alignment marks. The embedding material is described in Applicants’ specification at paragraph 29, 3rd sentence as “the bulk material of the imprint template surrounding the alignment marks.”

Applicants respectfully assert that amended independent claims 1 and 11 are neither anticipated nor rendered obvious by *Mancini* and are thus patentable over *Mancini*.

Further, Applicants respectfully assert that dependent claims 2-7 and 12-15, with their respective limitations, are likewise neither anticipated nor rendered obvious by *Gimkiewicz* and are thus patentable over *Gimkiewicz*.

III. REJECTIONS UNDER 35 U.S. § 103

A. *Mancini* in view of *Calveley*

Claims 8, 16, 19, and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Mancini* (U.S. Patent 6,387,787) in view of *Calveley* (U.S. Patent 6,165,911). Applicants respectfully traverse.

The Examiner asserts that *Mancini* fails to teach a release layer.

However, the Examiner asserts that “*Calveley* teaches the use of a release material layer with the stamp during the process (col. 7, line 53)” and that it would have been obvious to one of ordinary skill in the art to modify *Mancini* with the addition of a release layer as taught by *Calveley*.

With respect to claims 8 and 16, in response, as asserted above, Applicants respectfully assert that because *Mancini* fails to teach “alignment marks embedded in

an embedding material included in bulk material of the imprint template, wherein said embedding material surrounds said alignment marks” as recited in independent claims 1 and 11, from which claims 8 and 16 respectively depend, dependent claims 8 and 16 are not rendered obvious by *Mancini* in view of *Calveley* and are thus patentable over *Mancini* in view of *Calveley*.

With respect to independent claim 19, originally filed claim 19 does not specifically recite the words “release layer.” Thus, the Examiner’s reasoning with respect to claim 19 is not clear to Applicants. However, in the interests of further prosecution, Applicants have amended claim 19 to replace “depositing a material over the alignment marks” with “covering the alignment marks with the same material used to fabricate the imprint template itself.”

Mancini neither discloses nor renders obvious covering either patterning layer 20 or surface 22 with the same material used to fabricate substrate 12. Further, *Calveley* does not disclose covering contrast pattern 16 with the same material used to fabricate substrate 14.

Thus, Applicants respectfully assert that amended claim 19 is not rendered obvious by *Mancini* in view of *Calveley* and thus is patentable over *Mancini* in view of *Calveley*.

Further, Applicants respectfully assert that dependent claim 20, with its limitations, is likewise not rendered obvious by *Mancini* in view of *Calveley* and thus is patentable over *Mancini* in view *Calveley*.

B. *Mancini* in view of *Calveley* and further in view of *Jeans*

Claims 9, 10, 17, and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Mancini* in view of *Calveley* as applied to claims 8 and 16 above and further in view of *Jeans* (2004/0219246). Applicants respectfully traverse.

The Examiner asserted that *Mancini* fails to teach fluorocarbons.

Further, the Examiner asserted that *Jeans* teaches the use of fluorocarbons as a release layer.

Applicants respectfully assert that because claims 8 and 16, which depend from amended independent claims 1 and 11, respectively, are patentable over *Mancini* in view of *Calveley*, for the reasons described above, the Examiner's assertion is moot. Thus, Applicants respectfully assert that claims 9, 10, 17, and 18 are patentable over *Mancini* in view of *Calveley* and further in view of *Jeans*.

C. *Gimkiewicz* in view of *Jeans*

The Examiner wrote: "Claims 9, 10, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gimkiewicz. [sic].....Gimkiewicz fails to teach the use of fluorocarbons. *Jeans* teaches the use of fluorocarbons as a release layer...It would have been obvious to one of ordinary skill in the art to modify Mancini [sic] with the use of fluorocarbons as a release layer as taught by *Jeans*...."

Applicants suggest that the Examiner's text was intended to read "Gimikiwicz over *Jeans*" in the first sentence in place of "Gimkiewicz" and that the Examiner's text was intended to read "Gimkiewicz" in the last sentence instead of "Mancini." Applicants proceed accordingly.

Applicants respectfully assert that claims 9 and 10, which depend from amended independent claim 1, and claims 17 and 18, which depend from amended independent claim 11, would be patentable, with their respective limitations, over *Gimkiewicz* in view of *Jeans* if *Gimkiewicz* were available as a reference. However, Applicants respectfully assert that the Examiner's argument is moot because, as asserted above in the section with regards to *Gimkiewicz*, *Gimkiewicz* is a foreign publication published after Applicants filing date and is not available as a reference. Thus, Applicants respectfully assert that claims 9, 10, 17, and 18 are patentable over *Gimkiewicz* in view of *Jeans*.

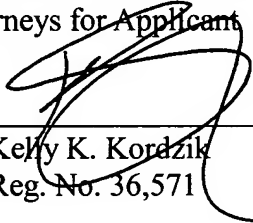
IV. CONCLUSION

As a result of the foregoing, it is asserted by Applicants that the remaining Claims in the Application are in condition for allowance, and respectfully request an early allowance of such Claims.

Applicants respectfully request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

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